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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,063	01/25/2002	Andrea Basso	2001-0045	3373

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Samuel H. Dworetsky  
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EXAMINER

KIM, CHONG R

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/057,063

Applicant(s)

BASSO ET AL.

Examiner

Charles Kim

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 10-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/25/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species A, claims 1-9

Species B, claims 10-19

2. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to

Art Unit: 2623

be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

3. During a telephone conversation with Samuel Dworetsky (Registration No. 27,873) on October 14, 2004, a provisional election was made with traverse to prosecute the invention of species A, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

#### ***Drawings***

4. The drawings are objected to because they are of insufficient quality for publication (see figure 5).

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 6, the phrase "based on the position information" in line 2 renders the claim indefinite because it is unclear which "position information" (the surface position

Art Unit: 2623

information in claim 1 or the position information in claim 5) is being referred to. For examination purposes, the “position information” will be interpreted as the position information recited in claim 5.

Claims not mentioned specifically are dependent from indefinite antecedent claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1-3, 9 are rejected under 35 U.S.C. 102(a) as being anticipated by the article entitled “Interactive Virtual Relighting of Real Scenes” by Loscos et al., (“Loscos”).

Referring to claim 1, Loscos discloses a computer-implemented method for digitally illuminating an object in real-time, comprising the steps of:

- a. capturing an image of an object (page 292, last paragraph of section 2.4 and figure 1a),
- b. providing at least a virtual light source for illuminating the object within the image (page 294, bottom of the left column and page 298, section 4.5),
- c. extracting a surface position of the object within the image (page 293, section 3.

Note that the surface position of the object is extracted during the 3D reconstruction/modeling stage; see page 291, top left column),

Art Unit: 2623

- d. illuminating the object at least at the extracted surface position with the virtual light source (page 298, section 4.5),
- e. displaying the illuminated object within the image (page 298, section 4.5 and figure 26).

Referring to claim 2, Loscos further discloses the step of creating a two-dimensional plane of the object within the image (pages 293-294, section 3).

Referring to claim 3, Loscos further discloses illuminating the two-dimensional plane with the virtual light source (page 298, section 4.5 and figure 26).

Referring to claim 9, Loscos further discloses that the step of illuminating the object at least at the extracted surface position includes applying a virtual illumination equation (page 292, section 2.4.1 and page 294, left column).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the article entitled "Interactive Virtual Relighting of Real Scenes" by Loscos et al., ("Loscos") and the article entitled "Photometric Image-Based Rendering for Virtual Lighting Image Synthesis" by Mukaigawa et al. ("Mukaigawa").

Referring to claim 4, Loscos does not explicitly disclose that the step of illuminating the object includes a step of combining a diffused light component with a specular lighting component. However, this feature was exceedingly well known in the art. For example, Mukaigawa discloses a step of illuminating an object with a virtual light source that includes a step of combining a diffused light component with a specular lighting component (page 117, section 3 and figure 1).

Loscos and Mukaigawa are combinable because they are both concerned with digitally illuminating an object using a virtual light source. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the illuminating step of Loscos so that it includes a step of combining a diffused light component with a specular lighting component, as taught by Mukaigawa. The suggestion/motivation for doing so would have been to provide the capability of synthesizing realistic images with keeping photometric consistency, thereby enhancing the digital illumination process (Mukaigawa, page 115, abstract). Therefore, it would have been obvious to combine Loscos with Mukaigawa to obtain the invention as specified in claim 4.

8. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the article entitled "Interactive Virtual Relighting of Real Scenes" by Loscos et al., ("Loscos") and Maki et al., U.S. Patent No. 6,072,903 ("Maki").

Referring to claim 5, Loscos does not explicitly disclose the step of tracking movement of the object for obtaining position information. However, this feature was exceedingly well

Art Unit: 2623

known in the art. For example, Maki discloses the step of tracking movement of an object for obtaining position information (col. 7, lines 34-52 and col. 9, lines 45-63).

Loscoc and Maki are combinable because they are both concerned with image processing methods for generating three dimensional models of objects. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Loscos so that it includes the step of tracking movement of an object for obtaining position information, as taught by Maki. The suggestion/motivation for doing so would have been to enhance the flexibility of the imaging system by providing the capability of creating a model of a moving object in a complex shape with practical accuracy and processing speed (Maki, col. 2, lines 45-53). Therefore, it would have been obvious to combine Loscos with Maki to obtain the invention as specified in claim 5.

Referring to claim 6, Maki further discloses the step of creating a three-dimensional model of the object based on the position information (col. 7, lines 53-62 and col. 11, line 12-col. 12, line 22).

Referring to claim 7, Maki further discloses that the three-dimensional model is an ellipsoid (col. 12, lines 8-23).

Referring to claim 8, Loscos further discloses that the step of displaying the object further includes using a texture mapper (page 294, left column).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



Art Unit: 2623

a. Munroe U.S. Patent No. 6,342,887 discloses a method for digitally illuminating an object using a virtual light source.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck

October 14, 2004

  
Jon Chang  
Primary Examiner